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CONTINUATION OF A REPORT ON THE PRESENT
STATUS OF THE TREATMENT AND
PROGNOSIS OF

ACCESSIBLE

Surgical Tuberculosis

BY

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FEB. 12. 1898

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REPRINTED FROM
THE CHICAGO MEDICAL RECORDER,
AUGUST-SEPTEMBER, 1897.

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FEB. 12-1898

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CONTINUATION OF "A REPORT ON THE PRESENT
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OCT., 1895.*

By J. R. McDILL, M. D., MILWAUKEE, WIS.

TREATMENT.

Roswell Park says: "It is well to emphasize first of all that tubercular disease when circumscribed and accessible is a distinctly curable affection."

In Watson Cheyne's work on Tuberculous Diseases of Bones and Joints, 1895, which is the principal authority of the English, much is a reproduction of his Astley Cooper Prize Essay in the first part and in discussing the essential feature of the tuberculous deposit he gives his adherence to the view that the epithelioid cells are the characteristic histologic element of tuberculous tissue. Now that tubercles in tuberculosis have been so long understood such discussion has lost all of its interest. Mr. Cheyne says: "The conclusion as regards arthrectomy and excision, which seems warranted by all the facts, is that arthrectomy is the proper radical operation in children up to the age of 15 or 16 years, and excision in patients who have reached their full growth." Very little is said of the value of parenchymatous injections of iodoform, carbolic acid, chloride of zinc, etc., which probably expresses or implies his estimate of its value. The borrowed illustrations are altogether crude and the few original illustrations are of no greater artistic merit. It is a pity they are not more worthy of the text.

General treatment and the technique of local treatment by injections remains materially the same as given in the article published in the Recorder in Oct., 1895. The development of the causal treatment of tuberculosis, by such men as R. Koch, Edwin Klebs and others has the greatest interest at present, as it is evident that these undaunted men, with their great knowledge

*Prepared for the Wisconsin State Medical Society, May, 1897.

and persevering labors would not venture to recur to this subject without good cause.

Schueller (1-2) repeats his opinion of the favorable constitutional action of guaiacol in connection with iodoform injections for local tuberculosis, and Winkler (3) strongly endorses his views from his observation in the clinic of Mosetig-Moorhof (4), who also reports enticing results from local hypodermic injections of teucrin. For a good clinical study of injections of iodoform-glycerine in tuberculous osteomyelitis, see the work of H. M. Sherman and Agnes Walker (5).

Faisan (6) reports a few cases to show that under certain circumstances the treatment of tuberculosis with creosote gives rise to severe cerebral symptoms which may be mistaken for tubercular meningitis. He recommends that guaiacol be given instead.

GENITO-URINARY TUBERCULOSIS.

The subject of uro-genital tuberculosis has finally received the attention it merits at the hands of Senn, who has just published a work of 300 pages, appropriately illustrated, entitled "Tuberculosis of the Genito-Urinary Organs, Male and Female." This latest work by this master is put upon an etiologico-pathological basis, and the bacteriology has received much attention. The work was in press when compiling this paper and a few scattered notes on the subject were printed before the proof could be attended to. These are omitted in this reprint and this chapter of tuberculosis will soon receive attention in a separate article, now that Senn's work is at hand.

LOCAL TREATMENT BY BIER'S METHOD.

Many theories have been entertained as to the *modus operandi* of blood stasis as a curative agent. Bier says that perhaps the most plausible is the one propounded by Hamburger—that the blood highly charged with carbonic acid gas on account of its increased alkalescence is more destructive of bacteria than arterial blood. It is thus that Hamburger explains the immunity of the lungs in a state of stasis. Bier's method has also operated favorably in gonorrheal arthritis.

Zirmatzky (106) combines with good results Lannelongue's sclerogenic treatment with Bier's method in the early stages of tuberculous osteo-arthritis. Advanced cases are not adapted to the treatment.

Bier (7) reports his extensive experience in which he has had over 200 cases of tuberculosis under treatment by venous congestion. He still believes that this method is the most excellent one which we possess against tuberculosis and therefore deserves more consideration than it seems to have received so far. He says, whoever has once seen a painful and useless joint restored to function in a short time by this means and continue to improve can hardly doubt its worth. In one respect this method far excels all other treatments; it secures to the joints, which recover, the best imaginable functional results.

Mikulicz (8) reports 12 cases treated after Bier's method, and indulges in some very interesting speculations as to the manner in which these cases are favorably influenced.

TUBERCULOSIS AND SYPHILIS OF THE TENDON SHEATH AND RICE BODY TUBERCULOSIS.

In an extensive and profusely illustrated work, Riese (9) gives a review of former works concerning the nature and origin of these so-called rice bodies, to which Goldmann adds the microscopical appearances, etc. In regard to the compiled results of his investigations, Riese agrees fully with the views of Koenig, Landow and their predecessors, that all rice bodies in tuberculous joints, tendon sheaths and mucous sacs are derivatives (Fibringerinnung) of fibrin, by coagulation. The chief groups are from fibrin coagulations which occur in the synovial fluid itself. The other chief groups arise from deposits on the wall of the synovial cavity and whose cells have become partially organized. That rice bodies have nothing to do with a benignant or low grade form of tuberculosis, as B. Goldmann believed, is shown by the inoculation experiments of Riese, who produced in animals, extensive tuberculosis with a very small number of them. Hence rice body forms of tuberculosis must be treated just as energetically as any other form.

Tuberculosis of the tendon sheaths, Schuchhardt (96) differentiates the tuberculous fungus into the nodular and the rice body hygroma.

(a) The tuberculous fungus always begins in a circumscribed spot of the tendon sheath, generally following traumas and is transmitted to the spot through the circulation, very seldom from direct inoculation and readily extends to neighboring tissues as well as along the tendon itself. The tuberculous granulation tissue contains typical tubercles often free from bacilli, but also free giant cells independent of the tubercle growths or of

the diffuse "tubercular inflammation." The affection recovers spontaneously or progresses to caseation, suppuration and lymphatic infection, (3 cases).

(b) In the tendon sheaths develop circumscribed firm growths, in resistance elastic, yellowish gray in color, with no tendency to caseation. They have been often described as sarcoma or fibroma.

Extirpation gives favorable results. (3 cases).

(c) Rice bodies are always tubercular in their nature and are peculiarly changed portions of the tubercular surface which have become detached. This change consists in a fibrinous transformation of the connective tissue, in which the nuclei have perished and the substance gradually takes the character of threaded or flaky fibrin and takes the Weigert stain. There exists no absolute relation of tubercular rice body formation with the fibrous degeneration. There is not alone tuberculous exudation without rice body formations, but there is also a fibrous connective tissue degeneration without tuberculosis. Of this latter condition, Schuchhardt refers to subcutaneous hygroma, for example, as it occurs in the knee and again to the pseudo-arthritis after fractures of bones; the resulting process of separation in the tissues is a result of fibrous degeneration.

A striking feature in the histologic picture of these conditions is the enormous giant cells, which appear to have an osteoclastic function and produce resorption, and certainly have nothing whatever to do with tuberculosis.

Schuchhardt recommends early surgical measures for all forms of these affections.

In regard to syphilis of the tendon sheaths, according to the compilations of Schuchhardt, the literature is very scant, as far as the tertiary or gummatous form is concerned. In one case of undoubted tertiary Lues in a woman, Schuchhardt was able to demonstrate a necrotic tendo-vaginitis which could not possibly be confounded with tuberculosis. In this case also, numerous giant cells of Langhans were found in the connective tissues. This affection concerned, as is usually the case in syphilis, the extensor tendons of the fingers.

BONES AND JOINTS.

Koenig (11), published in 1896 a work on tuberculosis of the bones and joints of 186 pages and 42 wood cuts.

The knee joint is treated by Professor F. Koenig.

The statistical portion is worked out by Drs. F. Mertens and W. Koenig.

Koenig has in view the publication in separate parts of a "Special Tubercloses" of the joints and bones of the body. These communications are founded upon his own collective experiences of 20 years in the Goettingen Clinic. A work upon the hip joint will shortly follow the book upon the knee joint, dedicated to E. v. Bergmann.

Koenig (10, 11), says: "He who has only a superficial acquaintance with the immense pathologico-anatomic differences in joint tuberculosis, as they are presented in their beginnings and during the course of their developments must be of the conviction, that there does not and cannot exist any perfectly uniform treatment of joint tuberculosis in general, and of knee joint tuberculosis in particular. The mode of treatment must be adapted to the indications of each case and so much the more as during the clinical course, particularly through the occurrence of faulty position, new demands upon the treatment arise.

During the last 18 years there have been treated 720 patients with knee joint tuberculosis, in the surgical clinic at Goettingen, but from only 615 have the final results been recorded. In 1893, 410 of them were living, 66.7 per cent. To the present time 205 of them have died, 33.3 per cent., of these, 140, 81.4 per cent, died of tuberculosis, 18 died of acute infections, 2.5 per cent.

Of 498 cases, 257 were osteal; 241 synovial; 191 cases were treated conservatively, 27 per cent; 512 cases were treated by operation, 73 per cent; by arthrectomy, 150 cases, 21.5 per cent; by resection, 300 cases, 43 per cent; by amputation, 91 cases, 13 per cent.

Of 269 resections, 183 recovered, 85 have died, 58 of these of tuberculosis; 139 resected joints are described as very useful results. Of 138 arthrectomies, 106 healed, 11 did not heal, 22 have died, 18 of them of tuberculosis; 67 operated cases had shortening; 23 had very crooked joints; only one joint remained movable. Of 56 cases handled conservatively, only 36 showed good results; of 25 cases treated with carbolic injections, 20 recovered; of 40 cases treated with iodoform injections, 13 are well, 8 with movable joints, 13 were operated later, 6 died.

Koenig then discusses the processes, through which the fibrinous deposits upon the cartilages of tuberculous joints have an influence. He shows that the fibrin deposits itself particularly on certain areas of the cartilaginous covering of the joint sur-

faces of the condyles of the femur from the patella downward, how it organizes on these places, beginning from the synovial border and in consequence of the manifold destructive occurrences on the cartilage (cribiform perforations, formation of cavities and sinuses, etc.), extends from the surfaces to deeper parts and likewise can be made responsible for similar processes on bone tissue; so that, the consequence is, the necessity arises of revising the question of primary bone foci upon the basis of these investigations. Also the cicatrization and complete cure, the peculiar recovery with formation of a new capsule and apparently an entirely new joint, is to be attributed to these facts.

From the statistical material dwelt upon, the entire amount was from the surgical and his private clinics, between October, 1875, and October, 1893, comprising 720 patients under constant treatment.

Koenig's standpoint on the question of combatting knee joint tuberculosis can be made plain in a few sentences. There is a recovery from knee joint tuberculosis with conservative treatment. Only a percentage, and not a very great one, of these so cured, obtain a perfectly normal function in the knee joint.

If the disease lasted a long time and severe contractions ensued, complete recovery of function cannot be hoped for, even should the cure follow a conservative treatment. The knee will be more or less stiff and also in a false position. In the majority, particularly in the aged, suffering from knee joint tuberculosis, it is advisable on economic grounds to eradicate the disease by curative treatment, if possible, in a definite time, after expectant treatment has been given a fair trial. Should the function of the joint be lost, it makes no difference, as after any other tedious treatment the result would have been the same, i. e., ankylosis. The nature of the procedure in these cases should be arthrectomy in children, resection in adults.

In those cases in which the bone disease extends beyond the epiphysis, in which extensive abscess and fistula formation are present, probably complicated with liver and kidney affections, cure can only be achieved by excision of the diseased joint, or amputation. A number of excellent wood cuts accompanies this brilliant work.

LIPOMA ARBORESCENS OF THE KNEE.

The last work of Stieda, of Tuebingen, recently deceased, describes in connection with the knee a lipoma arborescens of the hip joint connected with arthritis and osteitis deformans. Stieda

claims this condition occurs in chronic inflamed joints affected either by tuberculosis, or arthritis deformans, etc. Radical operative treatment is the only remedy.

HIP JOINT.

The chiefest results of a most carefully prepared work, by G. Wagner (12), of Tuebingen, in 1895, have been already laid down by Bruns and is published under the same title in the *Deutsche Med. Woch.* XX. 17, 1894, and is freely extracted in my compilation on this subject in the October number of this Journal for 1895.

Liermann (13), of Frankfurt, states that the chief fundamental indications of modern coxitis therapy consist in conservative and ambulatory treatment. These methods are always considered correct, as at the same time they are not only adapted to every specific treatment which may be combined with them, as for instance, the much practiced iodoform therapy, but they actually enhance their favorable effects.

The diseased joint must immediately at the beginning of the treatment be made functionally inactive by fixation and repose and later also apply permanent extension. The ambulant treatment fulfilling these indications is achieved by a portable apparatus of which those of Hessing, Hoffa and Lorenz are particularly worthy of mention. Lierman has also constructed an apparatus.

Sasse (14) in his work last year has thoroughly examined 110 cases of coxitis from Bergmann's clinic. About half of them were under constant supervision, the remainder were treated from the polyclinic. 53 of these cases Sasse followed personally; 21 cases have died, and 22 cases are still recent. Most of the patients were between 2 and 9 years of age:

27 were resected, 83 were not. Of those resected 8 died, 29 per cent; of those treated conservatively 13 died, 15.7 per cent; of the latter 50 recovered, 10 are near convalescence, and 7 left before the end of treatment.

His conclusions are:

1. Tubercular coxitis in children treated conservatively gives good results in 80 per cent of all cases adapted to this treatment; in the remaining cases, resection, etc., cannot be avoided.

2. Recurrence after conservative treatment is relatively infrequent and can usually be subdued by timely repetition of the treatment without resorting to resection.

3. About one third of the abscesses arising during the course of the disease can be healed by iodoform injections, the other two-thirds require operative interference. Incidentally, he says, iodoform injections may give rise to a miliary tuberculosis, but does not instance cases.

4. The main demands on conservative treatment are complete fixation of the joint, relief from harmful pressure, etc. Extension is, aside from special indications, generally dispensable.

5. Plaster casts from the toes to the nipple fulfills most indications of conservative and ambulant treatment and has the advantage of simplicity and cheapness.

6. The results obtained by this treatment he considers decidedly more favorable than the progress of coxitis otherwise treated, as he attempts to show by comparison with Brunn's statistics. Separate clinical histories of the cases are given.

ANKLE JOINTS AND TARSAL BONES.

A recent work by Spengler (15) comprises 136 cases of tuberculosis of the foot which were treated from 1873 to 1894 in Kocher's clinic. Patients' ages were from $1\frac{1}{2}$ to 78 years. Half of the cases occurred between the age of 10 and 30 years. Men were oftener affected than women.

About one-fourth had a tuberculous heredity. In about half of the cases there was a history of antecedent trauma. Half of the cases were primarily osteal, and one-fourth primarily synovial. 30 cases were treated conservatively by injections, incision or ignipuncture. Atypical resection was oftenest performed. This work will repay close study. Treatments and results are carefully tabulated. Every kind and combination of treatment was employed, according to the nature of the case, and each case must be handled according to its special indications. Results were generally very good.

TUBERCULOSIS OF THE ALVEOLAR PROCESS AND INFERIOR MAXILLA.

In all the cases in Czerny's clinic during the last twelve years, there have been only eight undoubted cases of tuberculosis of the lower jaw. He practices prompt resection in young people and cleaning out of the cavity in elderly patients, followed later by resection if necessary.

Zaudy has collected from the literature 36 cases of this rare disease of the alveolar process of the jaws. Injection is usually through the teeth. Radical removal is advised.

TUBERCULOSIS OF THE CALCANEUS.

Finotti (16) reports 40 cases observed in the Innsbruck clinic, in which the tuberculosis either appeared only in the calcaneus or in which the disease began in the calcaneus. The tuberculosis remains mostly limited to the calcaneus and only in rare cases or in the later stages of the tuberculosis does it invade the neighboring bones and joints. This is due to the somewhat isolated locations of the bone, whereas the other smaller tarsal bones with their numerous intercommunicating joints are so intimately connected that extension of the disease is exceptionally favored; further, the larger tendon sheaths run over the calcaneus, which structures are often and readily attacked by the disease. The tuberculous process has a special predilection for the anterior portion of the bone, and perforation occurs usually at the sides. Sequestration occurs very frequently in the calcaneus, whereas it almost never happens in the other short bones. That the anterior portion of the calcaneus is most frequently attacked by tuberculosis, is due to the fact that there is found a spongiosa soft with marrow and poor in vascularity, where aside from the slightly developed circulation and blood supply, a favorable soil in the tissue itself is offered for the development of wandering bacilli. The resistance to perforation of a focus is less at the lateral surfaces than elsewhere. In 14 cases the process had extended to the tendon sheaths and in 11 of these the peronei tendons were affected. As the disease remains a long time limited to the bone, the prognosis offers better results from partial or total resection of the calcaneus than when the other tarsal bones are involved. In children and very young persons cure is accomplished usually by partial osteotomy or currettement of the deposit followed by iodoform therapy. In adults total extirpation is recommended. The locomotion is thereby but slightly influenced. Tendon sheaths which are involved should be radically removed.

WRIST JOINT.

From the study of 71 cases of wrist joint tuberculosis in Ollier's clinic, Mondan (17) arrives at these conclusions:

Tuberculosis of the wrist joint is almost twice as often osteal than synovial in origin. The osteal proceeds most frequently from the carpus, which generally exhibits the "basin shaped" erosions; infiltration and sequestration are infrequent. Caseous foci and wedge-shaped sequestra are found in the epiphyses of the radius and ulna. The tendon sheaths are usually secondarily in-

fect. This joint affection is oftener in males between ages of 10 and 30 years and seems to favor the right side. Resection is recommended, but is contraindicated in very old and very cachectic persons who have marked visceral tuberculosis.

Of 52 resections 1 died from the operation; 29 recovered completely and have useful hands.

TUBERCULOSIS IN EARLY CHILDHOOD.

This is a special subject which has received considerable attention as such in the last 2 years by Cnopf (18), F. Goldschmidt (19), Rudolph Hecker (20), A. Wassermann (21), J. Walter Carr (22), Prof. Oscar Wyss (23), P. Simon (24), Louis Guinon (25), and Dr. Fahm (26), who have collected, studied and arranged the enormous material of tuberculosis in children.

The most interesting and instructive contribution to this subject is by Rovsing (27), who has had several opportunities of seeing a typical and very peculiar form of joint tuberculosis in earliest childhood, which can be exactly described as "*Pyarthron tuberculosum acutum*," and which has an especially good prognosis in that the arthritis not only has an acute beginning but runs an acute course, so that a cure follows the same means employed in tubercular peritonitis, namely simple incision or, as in these cases, arthrotomy.

Rovsing had observed 10 lesions in 7 patients between the ages of $1\frac{1}{2}$ and 13 months. The disease begins suddenly in apparently healthy children with rapid swelling and marked tenderness of the joint accompanied by fever. In all of these cases the diagnosis of tuberculosis was proven by microscopic and bacteriologic examinations and inoculation experiments. Two cases were of the shoulder joint, 5 in the knee, and the hip, ankle and sternoclavicular joints each 1 case. Complete function was obtained in all cases. This peculiar form of tuberculosis has not before been described. Probably some of Volkmann's cases described in 1860 as "*arthritis catarrhalis*" belong in this category.

From the experience in the Basel hospital for children, Wieland (28), emphasizes the fact that best results in children are obtained by iodoform treatment supplemented by orthopedic appliances, by minor surgical operations and above all by constant attention to strengthening the general health, by good nourishment, fresh air and guaiacol or creosote.

Results of iodoform treatment of tuberculosis in bone in the Basel hospital were as follows:

Of 21 cases of para-articular abscesses treated conservatively, by puncture and iodoform injection 16 were cured, 4 improved and one unimproved. Of 12 joint affections so treated, 9 recovered and 3 were improved. Of 9 cases treated by preliminary injections and later operated for abscess and joint disease, 4 recovered, 3 were unimproved and 2 children died. Of 28 cases of bone disease operated first and later treated by iodoform injections 25 recovered.

Conservative treatment of joints in children is most satisfactory in that the functional results are fair and even good in contradistinction to primary operative measures.

THE DIFFUSE LESIONS OF LIMBS AFFECTED BY JOINT TUBERCULOSIS.

Pilliet (29) has instituted very careful researches concerning limbs whose joints were infected by tuberculosis. In limbs the seat of far advanced tuberculous disease, no tissue is exempt from changes. These appear in two entirely different forms: inflammatory sclerosis or myxo-sclerosis and an inflammatory fatty degeneration. The sclerosis is rather to be regarded as an evidence of regeneration and the fatty degeneration as evidence of degeneration. Both are known results of chronic infections, but receive a special significance through their frequency, their tendency to spread and to their relations with tuberculosis. This is without doubt due to toxic material produced by the bacilli.

In conclusion, Pilliet calls the attention of surgeons to the importance of careful attention to and examination of the entire limb when it has a tuberculous joint.

It has long been observed clinically that the entire limb in which there is a tuberculous joint is almost always atrophied to a marked degree, and it has come to be regarded as of valuable diagnostic significance. An interesting research by J. Peysson Clark, of Boston, published in the Boston Med. and Surg. Journal in Oct., 1895, showed atrophy of the nasal mucous membrane in phthisis. This he found in over 200 cases and believed it to antedate the lung tuberculosis and perhaps contribute to its development. From what we know of atrophic processes in related structures following a tuberculous disease of one of them it might be that the contrary was the fact.

SPONDYLITIS AND OPERATION.

Ménard (30) in six cases of paraplegia complicating dorsal spondylitis, established a lateral drainage of the paravertebral abscesses instead of performing laminectomy. At the place of the

gibbus one or several of the vertebral ends of the ribs were exposed and resected subperiosteally together with the corresponding transverse processes. Through this space thus gained the abscess was opened by working forward close to the vertebral bodies. In cases of 3 and more years standing showing paralysis an almost immediate result was noticed, which gradually completely removed the motor and sensory disturbances.

PERITONEAL AND ABDOMINAL TUBERCULOSIS.

Koenig in 1884 was the first to recommend laparotomy as a routine treatment for tuberculous peritonitis which was justified by the clinical results following what Folet called the "happy error of diagnosis" that led Sir Spencer Wells in 1862 to open the abdomen in a case of tuberculous peritonitis which he thought was an ovarian cyst. Upon the speculative theory that the presence of air exercised a destructive effect on the anaerobic micro-organisms, Folet, (*Revue de Chirurgie*, 1894, No. 12), inflated the abdomen with air after withdrawing the fluid, in a case of tubercular peritonitis that refused laparotomy. The patient eight months afterward was in a very satisfactory condition. Mosetig v. Moorhof employed this treatment in a child 4 years old but sterilized the air through a solution of carbolic acid. Folet objects to this procedure and believes normal air is more efficient. Gatti who made experimental studies of peritoneal tuberculosis believes that laparotomy at a certain stage of the disease, which cannot be determined clinically, is followed by the best results and recommends that a second laparotomy be performed if a first does not seem successful.

Israel (31) reports 3 interesting cases of rapid recovery from abdominal tuberculosis, one involving peritoneum and intestines with tumor formation.

Loehlein (32) inquires why the post cervical vaginal incision into the abdominal cavity should not be preferred to celiotomy in establishing drainage for tubercular ascites. He had good results in two cases. The advantages of this incision when feasible are apparent. This incision is much used and advocated for exploratory and operative measures by W. R. Pryor of New York, *N. Y. Med. Record* L. 2, July 11, 1896; A. Mackenrodt, of Berlin, *Volkmann's Samml. klin. Vortr.* N. F. Nr. 156, 1896; F. Henroten, of Chicago, and others.

Stechegoloff (33) has recorded experiments on dogs concerning the well-known favorable influence of laparotomy upon peri-

toneal tuberculosis. Complete cure can only be obtained in cases not too far advanced, otherwise one must be satisfied with an essential improvement and a markedly increased lease of life. The favorable effect of a laparotomy has obviously to do with an excitation of the diseased tissue to a powerful reaction against the tuberculosis, and in this, different processes are concerned; the trauma and cooling of the peritoneum, the introduction of light and air, etc.

Evacuation of the exudate cannot be the main factor, because laparotomy acts just as favorably in those cases where there is no exudate whatever present.

Mader (34) does not consider laparotomy always necessary for peritoneal tuberculosis. He evacuates the exudate when present through a trocar; applies a firm cotton pressure dressing for a few days, allows the patient but little to eat or drink and puts the bowels to rest by opium. In 10 cases, 7 gave very good results.

Dr. M. Jordan (35) of Heidelberg reports a case, 55 years old, of peritonitis sicca of a large hernia. Incision showed an inoperable condition, the general peritoneum being also involved; the wound was closed and the mass, which was the size of a child's head, subsided, became reducible and the patient recovered and was well one year later.

Jordan had another case of peritoneal tuberculosis in an 18 year old girl, which had extended from the tubes; these were opened and left in situ. Complete recovery. He exhaustively reviews this interesting condition and discusses processes of healing from every standpoint from 10 cases examined in vivo during 2nd and 3rd laparotomies and also from post-mortem studies but does not throw any light upon the great question of how simple laparotomy cures peritoneal tuberculosis.

Vierordt (36) again takes up the subject of chronic peritoneal tuberculosis with 5 histories of children. Case V is interesting, as a vaginal discharge occurred in a 5 year girl, and he is inclined to believe that infection through the genital tract is not infrequent.

Roersch (37) has put together the immense material of Aldibert, 308 cases operated for peritoneal tuberculosis, and added 50 cases more.

Of these 358 cases, 253 or 70 per cent were discharged as cured; 118 were well 6 months later, 79 after one year, and 53 after

2 years; 83 cases died; of 20 dying soon after operation, 10 died from septic infection.

HERNIAL TUBERCULOSIS.

Altogether 19 cases of tuberculosis of hernia have been described up to this time, Tenderich reports 3 additional cases from the Greifswald clinic.

1. Tuberculosis of the sac in a boy 3 years old, operation and good result. Death several years later from phthisis.

2. Tuberculosis of the sac in a boy 7 years old. Operation. Good result.

3. Gangrenous femoral hernia in a 54 year old woman. At the operation and later, during the resection of the bowel, the small intestine showed numerous tubercles.

Tenderich (38) is of Brunn's opinion, that tuberculosis of hernias can appear as primary affections, but as a rule they are portions of general peritoneal tuberculosis. Operation is advised to remove the diseased area and radical cure can follow. Also in those cases where total removal is impossible, it being a part of general abdominal tuberculosis, the operation, nevertheless, has a most favorable effect on the entire disease and cures can be looked for in many cases. This disease is not easy to diagnose. Whenever the fluid contents of a thickened hernial sac can be returned to the abdominal cavity, this affection is probable.

Dr. K. Roth (39), of Heidelberg, reports 3 cases of tuberculosis of hernias from the Heidelberg clinic, which increases the number of cases recorded to 22. The paper is treated very fully and will repay a study.

TUBERCULAR MENINGITIS IN ADULTS.

From 1884 to 1892, 45 cases of tubercular meningitis in adults, cases over 15 years of age, were observed in the medical clinic at Zurich; 34 men; 11 women. One patient was discharged before end of disease; all the others died in the clinic and were dissected. This material was the basis of Krämer's (40) comprehensive dissertation. Krämer gives 23 clinical histories in detail, and then discusses in an exhaustive manner the literature in respect to the origin, course, appearances, treatment, etc., of the tuberculous meningitis.

INTRATHORACIC TUBERCULOSIS.

(Of all the organs the lungs are most frequently the seat of tuberculosis and as there is no lung affection that may not be complicated by tuberculosis it follows that pleural affections are most frequently tuberculous in character.

Dr. George Ryerson Fowler, Brooklyn, N. Y., at the Am. Surg. Assn., 1896, says that few patients who had suffered from pleurisy, escaped tuberculosis and this fact increases the importance of the surgery of pleuritic affections in their relations to tuberculosis. The consensus of opinion at the present day seemed to discountenance thoracotomy in tuberculous patients, preference being given to repeated puncturing or at most permanent siphonage by Bulau's method.

PLEURITIS, EMPYEMA AND HYDROPNEUMOTHORAX.

Dr. A. Aschoff (41) used the material in the medical department of the "Am Urban" hospital to produce his contribution on "the Etiology of Serous Pleurisy." He attempts to answer three questions.

1. Does a serous pleurisy exist without demonstrable cause which is not tuberculous?

Answer: The so-called idiopathic effusions are almost always related to tuberculosis. These can recover spontaneously.

2. Is there an acute isolated "rheumatic" pleuritis?

Answer: Probably not. Those effusions in the pleural cavity occurring during an acute arthritis are almost without exception due to heart lesions. Salicylic treatment has no therapeutic value here.

3. Can a serous exudate contain pus producing substances and yet not become suppurative?

Answer: Excepting possibly the pneumococcus exudate, no. The serous effusions are almost always free from pus germs, if they actually should contain them, they would sooner or later become suppurative, but can, nevertheless, recover without operation.

Eichhorst (42) seeks to ascertain, in the important and much contested question of serous pleurisy, how often it is tuberculous in nature. He injected from every case some of the exudate, into the peritoneal cavity of guinea pigs. At the beginning as long as Eichhorst employed too small amounts of exudate, he got very slight and apparently misleading effects; when he employed greater quantities, 15 ccm., it transpired that at least two-thirds of the exudates were tuberculous. Eichhorst's great astonishment at these findings is difficult to understand, as experience proves the old rule that every "primary" pleuritis should be regarded with suspicion.

How shall we proceed when empyema complicates phthisis.

Bäumler (43) at the congress in Rome went over the question, with citation of examples and arrived at the following conclusions: If the exploratory puncture shows the exudate to contain pus cocci—thoracoplasty with rib resection. Should no pus cocci be found, probably only a few tubercle bacilli, care and quiet are ordered. When marked compression of neighboring organs is suspected, the amount evacuated should be carefully considered; should no disagreeable symptoms arise and the collapsed lung appears to re-expand tolerably, after a certain time has elapsed, thoracoplasty may be ventured, and later, if necessary, obliteration of the cavity may be brought about by extensive rib resection. Should the condition deal with a large exudate of long standing in which the compressed lung at the same time shows no marked inclination to expand, frequent tapplings of small amounts may be tried or an improvement may be effected by the permanent aspiration-drainage, according to Bülow.

Bäumler mentions those well known cases in which pulmonary tuberculosis is favorably influenced by the occurrence of a pneumo-thorax with serous effusion.

Carriere instances a good example of this in his work, entitled *Sur un cas d'hydropneumothorax tuberculeux, resorption de l'épanchement intrapleurale, arrêt de l'évolution de la tuberculose pulmonaire*. *Arch. clin. de Bordeaux* III. 6. p., 262, 1894.

In these cases a too hasty and aggressive procedure would be unjustifiable.

RECTAL AND ANAL TUBERCULOSIS.

Sourdille (44) recounts a series of examples to the effect that there is an anatomic condition of the rectum which is clinically a characteristic tuberculous narrowing. This condition affects young people with hereditary taints; is sometimes primary, sometimes secondary and can be divided clinically into three stages: Proctitis, latency and stricture, and under certain conditions is amenable to operative measures.

Hartmann (45) goes over the entire field of anal tuberculous fistula and abscesses, and has collected the entire material for years. It is an exceptionally readable work and is arranged in an original manner. He advised operation in all cases and has never seen dissemination or aggravation of tuberculosis in other organs follow.

ADRENAL TUBERCULOSIS.

Letulle (54) reported an interesting case with post-mortem findings of adrenal tuberculosis. A young man who had for-

merly suffered from malaria, exhibited the symptoms of Addison's disease. Died suddenly. The adrenals were enlarged and caseous. Microscope showed giant cells and a few tubercle bacilli.

He points out the difficulty of prognosis and that sudden death occurs in visceral tuberculosis, particularly in tuberculous abscesses of the brain. Binaud had also observed a similar case. A patient was operated for anal fistula and died suddenly on the next day with a hyperpyrexia. Necropsy showed adrenal tuberculosis.

Coleman (55) found in a case of phthisis, 36 years, tuberculosis of both adrenals without bronzing of the skin and from a study of the changes present, is inclined to consider the adrenal lesion the primary and the lung lesion the secondary.

Renner (56) calls attention to two hitherto undescribed symptoms in Addison's disease which are not mentioned in text-books; the intolerable pruritus and the presence of numerous wart-like elevations scattered over the surface of the skin. He describes a typical case of the disease in which these wart-like prominences grew more numerous towards the end. At the necropsy the left suprarenal capsule was found in a state of cystic degeneration, with a cavity containing caseous products.

OPERATION FOR CURE OF ADDISON'S DISEASE.

Addison's Disease cured by Extirpation of one Supra-renal Capsule. Hadra (107) removed a tumor "the size of a small apple" from a woman of 55, situated directly on the spine, on a level with the stomach. It was causing great pain, dyspnea, night sweats, emaciation and extreme muscular weakness, with edema of the feet. Examination after removal disclosed that it was nothing else than one of the supra-renal capsules affected with tuberculosis, and the complications made plain a case of Addison's disease without the pigmentation, which is not always present.

A malignant retro-peritoneal tumor was diagnosed by Oesterreich (108) in the case of a woman presenting all the symptoms of Addison's disease. When removed it was found to be a supra-renal capsule in a state of tuberculous degeneration. All the various symptoms disappeared completely after the operation, and the patient has enjoyed fine health ever since. There was no organic lesions except this tumor and an old tuberculous focus in the lung. It must be evident, therefore, that the condition

of the capsule was responsible for the development of the disease. Hence, he says the removal of one or both capsules in Addison disease seems to be indicated. The operation should not be difficult as a tubercular capsule is more easily separated from neighboring organs than a sound one.

That tuberculosis of these bodies exists and causes Addison's disease naturally suggests the possibility of relieving such sufferers by surgical means and the two cases quoted show that single tuberculous adrenals can be, and have been, removed unintentionally, and in one case with a very happy result. It is impossible to avoid in this connection some reference also to treatment by opotherapy.

Langlois believes from his observations of experiments by himself and others that they permit of the conclusion that opotherapy is a legitimate treatment in Addison's disease.

Opothrapy in Addison's disease when followed by improvement may be but temporary and should be submitted to rigid criticism as both glands may be involved. Improvement is sometimes striking, but fluctuations in the activity of untreated Addison's disease are common, and in no given case is it easy to decide whether an arrest came spontaneously or through therapeutic agency.

Schilling (Münch. Med. Woch. February 16, 1897), discusses the function of the supra-renal bodies, referring particularly to the recent researches of Mühlmann, who found pyrocatechin in the medulla of the gland. He believes this is not converted in Addison's disease into a harmless compound on leaving the supra-renal body and entering the circulation. Mühlmann believes that in health the elimination of pyrocatechin occurs through the agency of the sympathetic ganglion cells. This theory offers the best explanation of the phenomena of Addison's disease, the debility, etc., being the signs of chronic poisoning with pyrocatechin. Thus Addison's disease is to be looked upon as an auto-intoxication.

Osler has also written on this subject:

If a patient's adrenals have been destroyed or permanently crippled it is hard to understand how feeding with sheep's or pig's adrenals for a short time will restore the patient to health which he will be able to maintain without the assistance of his own.

GLANDULAR TUBERCULOSIS.—MAMMARY GLAND.

Spediacci (57) gives an exhaustive review of tuberculosis of the mammary gland. It follows that this form of tuberculosis is quite infrequent, almost always appears in women who have borne and nursed children, and usually between the 25th and 35th year; and further, is secondary to a tuberculosis in some other part of the body. But one case in a man is known.

Spediacci produced tuberculosis in rabbits and guinea pigs and studied on them the disease of the breasts. He found that the tubercles formed in the gland tissue proper, during which the connective tissues exhibited reactive disturbances principally. When nursing animals were infected the young died, but Spediacci thought, not alone from tuberculosis but from a poison, which the tubercle bacilli developed in the body of the mother.

Mandry (58) searched the literature and studied 7 cases of mammary tuberculosis in the Tuebingen Clinic and found 40 cases, 21 of which seemed genuine. They were all of the adult female breast.

The writer of this compilation has a case of mammary tuberculosis to report in a woman 34 years of age, of 5 years' standing. Limited excision and other treatments having failed and the nipple having become involved, the mamma was extirpated. Diagnosis by microscope.

Reerink (59) reports in addition to the work of Mandry a case from the Freiberg surgical clinic of tuberculosis of the female breast in a patient 32 years old, with no hereditary taint. The probable diagnosis was made immediately after operation from the histologic picture and made positive by discovery of tubercle bacilli. In connection with this observation Reerink takes up the question of the manner in which the disease arises, with especial reference as to what extent a primary tuberculosis of the mamma can be considered possible. A priori, three possibilities are conceivable as causes of the disease:

1st. A direct infection from without along the excretory ducts. By this path the disease could certainly gain entrance very rarely.

2d. A direct extension by continuity from a neighboring tuberculous affection. This class of cases is to be regarded as secondary. Primary tuberculosis of the mamma can only be considered where each and every tuberculous disease in the vicinity has been excluded or where proof is adduced that any such condi-

tion has followed an already existing disease in the mamma. There remains only the

3d method: When the disease comes through the circulatory channels,—hematogenous. We must also constantly bear in mind not only hereditary predisposition but also latent tubercular disease in the case in question. Extirpation is recommended with excision of axillary glands.

Sabrazes and Binaud (60), in addition to our present knowledge of mammary tuberculosis, report very thoroughly upon their own observations with exact investigations. Aside from those cases in which the tuberculosis is a direct extension from a neighboring tuberculous ulcer or rib caries, they believe that the leucocytes are responsible for this rare infection of the mamma and that an accidental cause is necessary to start it, which is, in the cases described, generally a trauma. In the portion of the mamma so damaged numerous leucocytes laden with bacilli and tuberculous poison are deposited and thus originates the tuberculous abscess. That the functional activity of the breast can produce tuberculous milk from the entrance of tubercle bacilli from other parts of the body, they consider possible but improbable and totally unproven despite the many beliefs in this condition.

Villar (61) believes with Spediacci that not all cases described as tuberculosis of the mamma are really this disease. Those cases only are certain in which, besides the known histologic changes, the presence of tubercle bacilli have been demonstrated and those in which experimental inoculation has produced tuberculosis in animals. His cases were subjected to all these provings. He recommends amputation.

Gaudier and Peraire in the *Revue de Chirurgie* for September, 1895, add three new cases of mammary tuberculosis to the thirty-nine, that they say have so far been reported in medical literature. Age seems to have little influence. One of the patients was 20 years of age, another 45, etc. They found nothing in the histories that would point to the influence of trauma in their three cases.

TUBERCULAR LYMPHADENITIS, PAROTITIS, TONSILITIS, ETC.

Tubercular lymphadenitis is universally treated by excision of all glands and their connecting lymph channels as radically as though operating for carcinoma, and the operator should always aim to remove these growths in one mass through free

incisions. When some glands of an infected chain have become abscesses they should be opened, curetted and iodo-formized before proceeding with the incision.

Cordua (62) was led to try conservative treatment of lymphatic glands in a state of tuberculous suppuration by puncture and irrigation followed by pressure dressings for eight or ten days. Only the rare cases of course where but a few glands are infected and well broken down are adapted to such treatment. The knife is the only remedy for the great majority of these infections.

Czerny (63) removed from a 15 year-old girl a packet of swollen tubercular cervical lymphatic glands and a bean sized tumor from under the left upper lid. This tumor was determined by Salzer to be the lachrymal gland in a tuberculous condition, with beginning caseation although no bacilli were found. He believes that this condition of the lachrymal gland is perhaps more common than the scanty literature on the subject would lead us to believe.

The unfortunate tendency to recurrence of disease after the most thorough excision of cervical tubercular lymphadenitis can perhaps find some explanation in the following papers by Starck, Krückmann and others concerning the relations of tuberculous disease of this region to carious teeth and tonsillar crypts which harbor the bacilli of tuberculosis and are no doubt very often the *atria morbi*.

The deduction is plain and imperative that no operation for tuberculosis of the lymphatic structures of the neck can be considered completed until defective teeth, disease of the gums, tonsils and other adenoid tissue of the naso-pharynx have been removed or destroyed.

Starck (109) was able to demonstrate in 41 per cent of his cases of tuberculosis of the cervical glands, the existence of carious teeth. The glandular disease corresponded in location, in time of development and in intensity with the condition of the teeth. Caries of the teeth of one or the other side of the jaws was associated with enlargement of the glands of the same side, and caries of the front teeth existed in conjunction with enlargement of the anterior glands about the angle of the jaw. Previous to the development of the glandular enlargement there was frequently a history of toothache or caries. Caries of many teeth was usually associated with enlargement of a chain of glands, while caries of a single tooth and slight enlargement of the glands

existed together. He reports two cases in which he was able to demonstrate positively that carious teeth had been the point of entrance of the tuberculous poison. One was that of a boy, aged 18 years, the other that of a girl aged 14 years. They had no hereditary predisposition to tuberculosis and previously had always been healthy. In both cases the glandular enlargement ensued subsequent to toothache. In the case of the boy, in two molar teeth numerous tubercle bacilli were demonstrated. In the case of the girl, between the roots of a molar tooth was seen a macroscopic suspicious granulation tissue, which on microscopic examination, was found to consist of tuberculous nodules and giant cells. In this case although operated upon, a recurrence ensued after an interval of a year and a quarter. In three other cases such intimate connection between caries of the teeth and tuberculosis of the glands could not be proved, though it was probable. The carious teeth and the enlarged glands should be removed at the same time, whereby the liability of general infection and local reinfection is reduced to a minimum.

Concerning the Relations of Tuberculosis of the Cervical Lymphatic Glands to Tuberculosis of the Tonsils.—Krückmann (110) confirms the observations of Hanau-Schlenker (111). In thirty cases of lung tuberculosis, there was tuberculosis of the tonsils twelve times. An apparently primary tuberculosis of the cervical glands can also develop from the tonsils, even when the clinical examination fails to demonstrate the presence of pulmonary tuberculosis. In one case there was tuberculosis of the tonsils and the mesenteric glands only. This was presumably due to ingestion of bacilli with the food, the bacilli becoming localized in the organs that especially receive and retain foreign elements, while the mucous membranes themselves did not become infected.

Pluder and Fischer (112) found five cases of tuberculosis among 32 patients with enlargement of the tonsils. In no case could the disease be found elsewhere. They are macroscopically not to be differentiated from the ordinary hypertrophied tonsil.

Tussau (113) believes with Schlenker (111) that tuberculosis of the tonsils is more frequent and more serious than has heretofore been acknowledged. The first thinks it is a chronic inflammation caused by alcohol and tobacco in the majority of cases which prepares the way for the T. B. Tussau gives three short clinical histories as examples and mentions in concluding how unthankful is the treatment of chronic amygdalitis and tonsil

tuberculosis. The only effective means are cauterization by either thermo-cautery or electro-cautery.

Brueckmann (64) found in sixty-four bodies examined within six months tuberculous changes in twenty-five of them, and in twelve of these the tonsils were involved. In almost all of the cases the relation between tonsil and cervical tubercular lymphadenitis stood out most clearly, so that in fact the generalization of the rule or maxim that secondary infection of the cervical glands can come from the tonsils seems to be completely justified. The infection of the tonsils follows either from the sputum of a contemporaneous lung disease or from a primary infection independent of any pulmonary lesion.

Dieulafoy' (65) has turned his attention to hypertrophic tonsils and adenoid vegetations of the naso-pharyngeal cavities, and from the first mentioned has inoculated sixty-one guinea pigs and from the latter thirty-five pigs, of which animals eight and seven respectively became tuberculous. He therefrom concludes that tuberculosis of the tonsils is not at all so rare as has been long believed in these sufficiently known but uncharacteristic hypertrophies. These tonsil tubercloses often enough remain latent and unrecognized and disappear in time (years), but in other cases regional infection of the lymph glands occurs in the neck from above downwards and pulmonary or general tuberculosis becomes possible at any time. Dieulafoy seems to assume that in his cases the tonsillar tuberculosis was a primary infection from the mouth, but instances no proof of this. That the tonsils, primarily or secondarily, readily become tuberculous and that the infection extends easily to the cervical lymphatic glands is proved by the investigations of Brueckmann in 1894.

Stubenrauch (66) reports a chronic parotitis which he proved to be tuberculous; he was unable to find any other case of tuberculosis of this gland recorded.

MUCOUS MEMBRANE AND SKIN TUBERCULOSIS.

In addition to the four forms under which skin tuberculosis is known (lupus, scrofuloderma, miliary tuberculosis and tuberculosis verrucosa cutis), Riehl (67) differentiates several other varieties of skin tuberculosis, which appear from their peculiar symptoms and history as independent clinical pictures.

1. A peculiar form of direct infection tuberculosis.
2. Tumor-growth skin tuberculosis.
3. Fibroma and tuberculosis.

4. Naevus and tuberculosis.

Doutrelepont (68) reports two cases of lupus hypertrophicus, in one of which the diagnosis cannot be considered positive without further proofs; the other was a case of infection tuberculosis (scrofuloderma).

Doutrelepont (69) has made a former report on peculiar cases of skin tuberculosis and reports here three new observations.

In a 6 year-old girl the disease appeared in the form of numerous round smooth tumors, which rather suggested mycosis fungoides or sarcomatosis of the skin. The tuberculin reaction, the examination of the tumors and the appearance of characteristic nodules after extirpation of the tumors established the diagnosis. There could be no question of lupus hypertrophicus. The second case, 29 years old, exhibited at the same time on nose, upper lip and ear very striking swellings which proved microscopically to be a mixed lupus and lymphangioma. In the third case, 27 year-old man, a serpiginous tuberculous ulcer was engrafted upon the bubo, which healed after extensive destruction of tissue.

Fabry (70) reports with clinical histories and illustrations over 174 cases of skin tuberculosis which he saw in Dortmund during three and a half years. He describes the various forms. The work cannot be adapted to a short synopsis.

Knickenberg (71) and Heller and Hirsch (72) have exhaustively reviewed the entire subject of tuberculosis verrucosa cutis and refer freely to the works on this subject by Riehl and Paltauf, Doutrelepont, Fox, Fournier, Hallopeau and Leloir.

After a lapse of four years Liebreich (73) refers again to cantharidin injections as formerly recommended by him. He has continually employed it since and considers it to-day, as in 1891, an excellent treatment. Liebreich during this time has acquired very positive views concerning infectious diseases. He believes that the primary changes in tuberculosis, as well as in most other infectious diseases, originate in lowered vitality and weakening of the cells and that the tubercle bacillus finds lodgment later and is a "parasite of the disease," a "noso-parasite." Cantharidin is of benefit in that it strengthens the cells. Koebner, *Zur Kritik des Vortrages des Herrn Prof. O. Liebreich; Ueber Lupusheilung durch Cantharidin und über Tuberkulose: von Prof. Heinrich Koebner* (Sond.-Abdr. aus "Dermatolog. Ztschr." 1895), opposes Liebreich's position as untenable and seriously doubts his diagnosis and results.

NOSE, GINGIVA, PHARYNX AND ESOPHAGUS.

The esophagus can become tuberculous usually from the peribronchial and mediastinal glands or from its lumen, often as an extension from the pharynx or thirdly directly through mucous membrane. Glockner (74) instances examples from the literature of all three forms. By far the rarest form is an infection through the circulation as a manifestation of general tuberculosis. Glockner describes a case from the Pathologic Institute in Prague which is particularly interesting in that the muscular layers only were affected, all other tissues of the organ remaining entirely free from the disease.

Flexner (75) gives a short glance over the literature of esophageal tuberculosis and instances one case of his own in which the lesion broke through, into the lung and the pleura.

Fraenkel (76) describes a case of disseminated nodular esophageal tuberculosis unexpectedly found post-mortem with also a papillary cervix tuberculosis.

Koschier (77) gives exact clinical histories of sixteen patients with tuberculosis and six cases with lupus of the nose, all from the Stork clinic in Vienna. The six lupus cases were invariably typical mucous membrane lupus which never extended to cartilage, or bone nor ever formed deep ulcers. Radical removal was practiced, the aftertreatment was with lactic acid. The wounds never healed, but increased, and recurrences were frequent.

In Walter's (78) case of lung and larynx tuberculosis, extraction of a tooth was followed by a tuberculous ulcer of the gums which destroyed soft parts and bone and opened into the antrum.

At a meeting of the N. Y. Path. Soc. Nov. 11, 1896, Dr. J. S. Ely demonstrated the tuberculous nature of an ulcer of the gums in a young man otherwise apparently healthy. He found another case recorded by a Swede in Virchow's *Jahrsbr.* 1884.

Gottstein (114) reports 6 cases of primary tuberculosis of the pharynx. Gottstein's cases show nothing new concerning the manner of infection. He recommends radical removal and regards the prognosis as rather favorable.

Rosenberg (79) reports twenty-two cases of pharyngeal tuberculosis which were observed in 22,000 patients in Berlin, sixteen men, six women. It is usually secondary to lung or laryngeal tuberculosis; only three cases which could be called primary have been seen. Pain is the main symptom. Regional infection and fever failed to appear in all cases. Death followed as a rule in two to six months after its appearance.

EYE AND EAR.

Haug (80) describes the particulars of three new cases of focal or nodular tuberculosis of the lobe of the ear, one of which was interesting in that it became carcinomatous. Correct diagnosis is possible only by the microscope. Source of infection is often local, through piercing of the ears or lesions of the canal by the irritation of ear ornaments.

Haug (81) describes a perichondritis tuberculosa auriculæ, which usually occurs in tuberculous or hereditarily disposed male adults from 15 to 40 years of age. The exciting cause of the disease seems to be attributed to some previous often very remote trauma. Either behind the tragus or in the muscle appears a light reddening and swelling sensitive to pressure, tension or tickling; the affection gradually progresses with increase of the symptoms or with subacute advances and leads to a thickening, enlargement and infiltration of the entire muscle. During an exacerbation appear at times one or more doughy swellings on any part of the ear which open spontaneously showing fungous granulations or if opened before contain characteristic tuberculous contents, but nothing suggesting the synovial like fluid which is seen in ordinary perichondritis.

The perichondrium perishes completely, the cartilage is roughened and necrotic in spots. Notwithstanding these serious changes the prognosis is favorable, even after considerable time has elapsed. (5 months, Haug.)

Microscopic and bacteriologic examinations demonstrated tubercle in all its degenerations and the presence of tubercle bacilli. The neighboring glands often suffer from regional infection. Radical excision is advised, together with removal of infected glands, followed by after-treatment with iodoform by injection, if necessary, or balsam Peru.

MIDDLE EAR.

Tuberculous middle ear disease has been recently written upon by Guanowski, Koch, Cohnstaedt, Koerner, Haug, Knapp and others.

Of especial interest in Guanowski's (82) report on Otitis Media Tuberculosa is the following:

Tuberculosis of the breast, peritoneum, different joints, the skin and the kidneys in one case showed also a right sided chronic middle ear suppuration, with numerous polypoid growths of the mucous membrane of the tympanum, including

a necrotic hammer and incus consisting partially of pure tuberculous tissue and partially of angiomatous tissue with a few tubercles; necrosis of the inner wall of the tympanic cavity; exfoliation of the stirrup.

In two cases of Guanowski's and also in one case each, observed by Koch (83) and Cohnstaedt (84), the suppuration had extended to the mastoid cells, causing more or less extensive destruction; chiseling was resorted to, which was followed by local improvement, although the cases eventually resulted fatally from tuberculous pachy and leptomeningitis. In Cohnstaedt's (84) case the labyrinth was involved and totally destroyed in addition to caseous suppuration and destruction of the inner tympanic wall.

In one case of Koerner's (85) in which a lung infection succeeded to the ear lesion, the post-mortem showed a very unusual appearance, in that the tuberculous process had extended directly through the tegmen tympani to the dura mater and the brain. Covering the bone defect in the roof of the tympanum was a greatly thickened dura bedecked externally with voluminous and robust granulations in which were found imbedded numerous bony fragments; on its inner surface the dura was firmly adherent to the adjacent brain, and both were studded with hempseed to pea-sized partially caseated nodes. Besides this was found: miliary tuberculosis of the pia mater, a conversion of the mastoid, auditory canals and tympanic cavity into one large cavity filled with granulations and bone fragments into which opened freely the facial canal, the cochlea, one part of the semicircular canals, the fossa jugularis and the lateral wall of the carotid canal; complete destruction of the sigmoid fossa, of the sulcus transversus, suppurative phlebitis of the sinus transversus, and of the vena jugularis; this last vein was completely destroyed to the middle of the neck and was lost in an abscess the size of a hen's egg.

Primary tuberculosis of the mastoid has been observed by Haug (86) and Knapp (87). Haug's case was a woman with double sclerosis of the tympanic mucous membrane and severe pain deep in the right mastoid process. This was apparently normal except that the overlying small glands were swollen. These were excised, proved to be tuberculous, and were united to the bone by lymphatic vessels. As this procedure was not followed by relief from pain the mastoid was chiseled open; it was sclerosed and at a depth of 15-16 mm. the bone became suddenly

soft and opened into a bean-sized cavity, which, without a trace of pus, was found filled with a reddish brown pulpy mass. Microscope showed tubercle and tubercle bacilli. Operation was followed by immediate relief. Haug believed it to be a case of primary mastoid tuberculosis and is disposed to attach great weight to swollen superficial glands in such cases.

EYE.

Denig (88) has collected all the cases known of tuberculosis of the eye, and has tabulated them according as the eye was affected alone or later or at the same time other parts of the body were involved, besides the clinical histories and ophthalmoscopic findings of five cases.

Denig insists that primary tuberculosis of the eye must be admitted. For diagnosis the clinical picture is decisive, for the tubercle as well as the bacilli and the inoculation as well can be lacking for the diagnosis of tuberculosis. The older the case the better the prognosis. The eye, of course, offers a fine field for observing all stages of the infection.

CONTUSION TUBERCULOSIS OR THE RELATIONS OF TRAUMA TO SUBSEQUENT TUBERCULOSIS.

It has long been known that tuberculosis of bones and joints is prone to follow injuries, particularly slight injuries, and the surgeon is now not infrequently called to testify in accident and negligence cases to the possibility of this or other infectious diseases following a trauma. The courts have decided that pathogenic germs in the blood cannot be held to be the proximate cause of a disease, but that what medical men term the exciting cause, or injury, shall be considered the cause which set in motion the active agents of the disease, by preparing suitable conditions in the tissues for their growth, reproduction and consequent manifestation of their peculiar pathogenic properties.

Since the time of Koenig and Mueller's beautiful experiments of producing tubercular infarctions in bone, since supplemented by Watson-Cheyne, Schüller and Krause, the subject of the relation of traumas to the tubercular process has received much attention and has become of great importance from a diagnostic standpoint, as well as from the medico-legal point of view.

Becker (89) and Kaufmann exhaustively discuss the relations between injuries and tuberculosis with citation of examples. These relations have acquired especial importance on account of accident insurance law, whereby it is to be considered, that

the patient has also a claim for indemnity, if the accident occasions the outbreak of a concealed or threatened tuberculosis or hastens it.

Spengler's (15) paper on ankle and tarsal tuberculosis showed that in about half of the 136 cases there was a history of antecedent trauma. This paper is here already referred to under Bone and Joint Tuberculosis.

Sabrazes and Binaud (60) believe that aside from these cases in which a tuberculosis of the mamma is a direct extension from a neighboring tuberculous ulcer or rib caries, that the leucocytes are responsible for the rare affection of the mammary gland and that an accidental cause is necessary to start it, which is in the cases described generally a trauma. In the portion of the mamma so damaged numerous leucocytes laden with bacilli and tuberculous poison are deposited and thus originates the tuberculous abscess.

Perichondritis tuberculosa auriculæ, as described by Haug (81), he thinks can often be traced to a remote trauma.

Jaccoud (90) in 1896 also reports four cases in his paper on hospital tuberculosis, which belong to traumatic phthisis.

Three patients, who were previously healthy men, suffered injuries to the chest for which they entered the hospital and there became tuberculous. In two cases Jaccoud could trace tuberculosis to a traumatic pneumonia. The post-mortem examinations showed no traces of old tuberculous deposits, so that the assumption that they were hospital infections can not be denied. This report points to rather inefficient prophylaxis for these times in French hospitals.

Schilling (Münch. Med. Woch. No. 40. 1895) reports the case of a boy 8 years of age who showed brain symptoms eleven days after a severe fall. Fracture of the inner table, with irritation by fragments of bone, was suspected, but before operation could be made the patient died. Autopsy showed tuberculous meningitis and cheesy softening of the bronchial glands. It would seem most probable that the bacilli in the glands, where they were encapsulated and latent, becoming mobilized and set free in the circulation found at the seat of injury the favorable conditions for their lodgment and reproduction.

A patient of Wagner's (92) injured his elbow in 1886, which joint became tuberculous and later the lungs were attacked. Wagner traced in a comprehensive manner the phthisis in 1895 back to the accident in 1886.

A patient of Schaeffer (93), 34 years old, no hereditary taint, fell from a carriage upon the left side of the body. The result was symptoms of chronic inflammation of the membranes of the cord in the dorsal region. Five years later an exudative pleuritis occurred, and nine years after the accident death from pulmonary tuberculosis followed. Schaeffer thinks it probable that it was tuberculous meningitis which later attacked lung and pleura.

Tuberculosis of the urethra although very rare as a primary disease, when it occurs it takes place in a part of the urethral mucous membrane prepared for the reception and growth of the bacillus by some antecedent injury or disease.—Senn.

The predisposing causes of tubercular epididymis, given by the same author are: Inherited soil, antecedent or coexisting disease of the testicle and trauma. As exciting causes of tuberculosis of the testicle which is often secondary to the disease in the epididymis most authors enumerate traumatism and chronic gonorrheal inflammation in the posterior portion of the urethra and in the epididymis.

Cryptorchism is mentioned by Noyveau & Kocher as one of the most potent of exciting causes. Tuberculosis of these organs is noted for its insidiousness and chronicity although in rare cases Barling (*Double Acute Tubercular Disease of the Testis*, London Lancet, April 9, '92) says: "I can readily understand that in the event tuberculosis develops in a testicle or epididymis, the seat of an injury or antecedent inflammatory disease, that it might in rare cases pursue an acute course."

Dr. J. G. Mumford, of Boston, in an article on the treatment of sprains by massage (*Bost. Med. & Surg. Journal*), states that he has seen a number of cases of ankle sprains that resulted in severe chronic tuberculosis.

W. V. König's (17) report on tuberculosis in the shoulder joint showed that 11 cases followed trauma.

Further information on this subject can be found in the recent papers by Prof. Fuerbringer (94) and Dr. Paul Guder (95).

RELATIONS OF MALIGNANT LYMPHOMA, LYMPHOSARCOMA, CARCINOMA AND PSEUDOLEUCEMIA TO TUBERCULOSIS.

On the basis of several observations in Brunn's Clinic, Dietrich (96) discusses the relations of malignant lymphoma to tuberculosis. His conclusions can be summarized about as follows:

1. There does exist a combination of malignant lymphoma with tuberculosis in the glands themselves or in other organs;

yet an etiologic connection between the two cannot be acknowledged.

2. There are, not infrequently, cases of multiple lymphoma which clinically can hardly be differentiated from tuberculosis; there is indeed a rare form of tubercular adenitis which runs a course quite similar to malignant lymphoma, without softening or breaking down, and which can not be distinguished microscopically post-mortem.

3. Necrosis and softening do not suffice for a decision in favor of tuberculosis, as they are observed also in cases of positive malignant lymphoma; the cause is unknown and cannot always be attributed to the effect of injection treatment.

4. The diagnosis of malignant lymphoma must depend upon histologic examination of an excised piece.

5. The appearance of eosinophilous cells is perhaps of some diagnostic value; they are abundant in lymphoma and scarce in tuberculous adenitis.

Mueller (97) describes one case, which according to his belief is another proof of the tuberculous nature of multiple lymphosarcoma, or pseudoleucemia. Up to this time the literature contains but three cases worthy of record. One case each by Askanazi, ("Tuberkulöse Lymphome unter dem Bilde der febrilen Pseudo-leukämie verlaufend." Beitr. zur pathol. Anat. u. allgem. Pathol. Jena, 1888); Waetzoldt, ("Pseudoleukaemie oder chronische Mil-iartuberkulose?" Centr.-Bl. f. klin. Med. Nr. 45, 1890; and Cordua (Arbeiten aus dem pathol. Institut zu Goettingen, 1893.)

These cases offered the pathologic-anatomic picture of lymphosarcoma, the soft form predominating, with undoubted tuberculous processes closely associated. Of especial interest in all three cases was the insignificant regressive tuberculous changes to the enormous enlargement of single glands.

The dissertation is a very extensive and exhaustive work.

CARCINOMA AND TUBERCULOSIS BY PROF. RIBBERT.

Ribbert's (98) original article in 1894 on Carcinoma and Tuberculosis deals in extenso with the entire subject. He begins his paper with the statement that carcinoma and tuberculosis do not often occupy the same part of the body at the same time, except on the skin. He closes with saying that it seems to him probable from known facts that tuberculosis in one region of a case can be the exciting cause of carcinoma, and which he has described as a subepithelial connective tissue proliferation originating the carcinoma. In other cases other inflammatory causes are responsible.

This communication concerns Ribbert's (98) new cancer theory, in that it points to the combination of local tuberculosis with carcinoma as a not at all rare occurrence. In all cases Ribbert could demonstrate in beginning carcinomas actual tubercle nodules or at least giant cells, these cases exclude those described by him as connective tissue proliferation. The giant cells were regarded as evidence of local tuberculosis, as they neither showed the foreign body giant cells, around epithelia, nor could be set aside as another kind of giant cells, as Ribbert found in two cases of carcinoma of the eyelids, which occupied the glandular spaces and were probably caused by obstruction of the secretions. Bacilli as far as can be discovered, are not demonstrable in the giant cells. He could not determine with certainty whether in these eleven cases the tuberculosis or the carcinoma was primary. Ribbert inclines to the former, because in two cases of benignant epithelial hyperplasia, tuberculosis was present at the same time in the connective tissue. In this circumstance of the priority, Ribbert perceives a further support of his theory of carcinoma, as it would thereby be made clear that the connective tissue through the tuberculosis must first become in an inflammatory condition, before it proliferates into the epithelium, which is torn apart and thereby excited to malignant growth.

SKIAGRAPHY IN TUBERCULOSIS.

Tuberculous changes in bones and joints under the Roentgen rays (105) have excited much interest. The usual sharp contours of the bones are blurred and shadowy clouds mark the place of disease. The same appearance is caused by malignant or other growths. In primary osseous tuberculosis in the neighborhood of joints, skiagraphy can be of immense value, if the osseous disease can be thereby diagnosed and located before it has invaded the joint. After one such case skiagraphy should need no better argument to establish its claim to a place in every first-class surgical clinic and practice.

PROGNOSIS.

The last two years have added but little to our knowledge except that conservative treatment is even more firmly established by the clinical results and that the principles of prophylaxis are more generally observed.

On May 1st, 1895, Cornet (99) read a paper, already referred to, before the Medical Society of Berlin on the prevention of tuberculosis, which entirely corroborated his former work in this

direction. "We must regard sputum and particularly dried sputum as the almost only cause for the spreading of lung tuberculosis."

Whereupon Cornet reiterates his prophylactic demands; keeping moist and rendering inert the expectoration. Although little as yet has been conscientiously done in this direction, Cornet believes that material results have been established. He recalls to mind the decided reduction of mortality from tuberculosis in the Prussian prisons, and estimates that as the result of careful treatment of sputa in Prussia between the years 1887 and 1893, that about 7,000 people less died from tuberculosis than would have been expected from the average of previous years.

Plicque (100) thinks the influence of heredity in tuberculosis is greatly overestimated. The possibility of overcoming the tendency is not sufficiently considered, and children need not necessarily suffer the ills that have afflicted the parents. It is far more profitable to employ means to the improvement of the general health and to combat exposure and infection than to dwell on heredity.

Squire (101) also thinks that children of tuberculous parents present nothing in particular; they are only weakly in a general way, and inclined to disease, taking and become infected by tuberculosis so often, about 9 to 100 oftener than untainted, because they have the best chances of being infected by their own parents.

Beck (102) in the Berlin Institute for Infectious Diseases has repeated the investigations of Ehrlich concerning the significance of Diaz-reaction in the urine, and is convinced that its prognostic value is very considerable. The appearance of Diaz-reaction renders the prognosis unfavorable, and when it persists any length of time it indicates speedy death.

Charles L. Greene, of Minnesota, has published a very complete article on "The Diagnostic Value of Ehrlich's Diazo Reaction," in the *Journal of the American Medical Association*, February 24th, p. 256, 1894.

A peculiar mode of infection was discovered by Dewèrre (103), who examined the swarms of bedbugs in a bed occupied by one brother after another who became tuberculous and found that 60 per cent of the brutes contained numerous tubercle bacilli. The bacilli were found by the microscope, in cultures and by inoculation experiments.

Smokers will be relieved to hear that the investigations of Kerez (104) at the Hygienic Institute of Zürich, concerning the existence of tubercle bacilli in cigars, have resulted satisfactorily.

That diseased workmen introduce tubercle bacilli to cigars, through the sputum, is beyond question; but these germs live at longest ten days and are all dead long before the cigars leave the drying room and are put upon the market.

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CORRECTION.

Page 197 in article of October, 1895, the third paragraph from bottom of page concerning Wartmann's statistics is by Dott. S. Ercole (Rif. Med. IX. p. 249, 1893.) Contributo alla chirurgica della ossa e delle articolazione degli arti.

200 WISCONSIN STREET.

